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The Western Rock Lobster Fishery 1976–1977

BY

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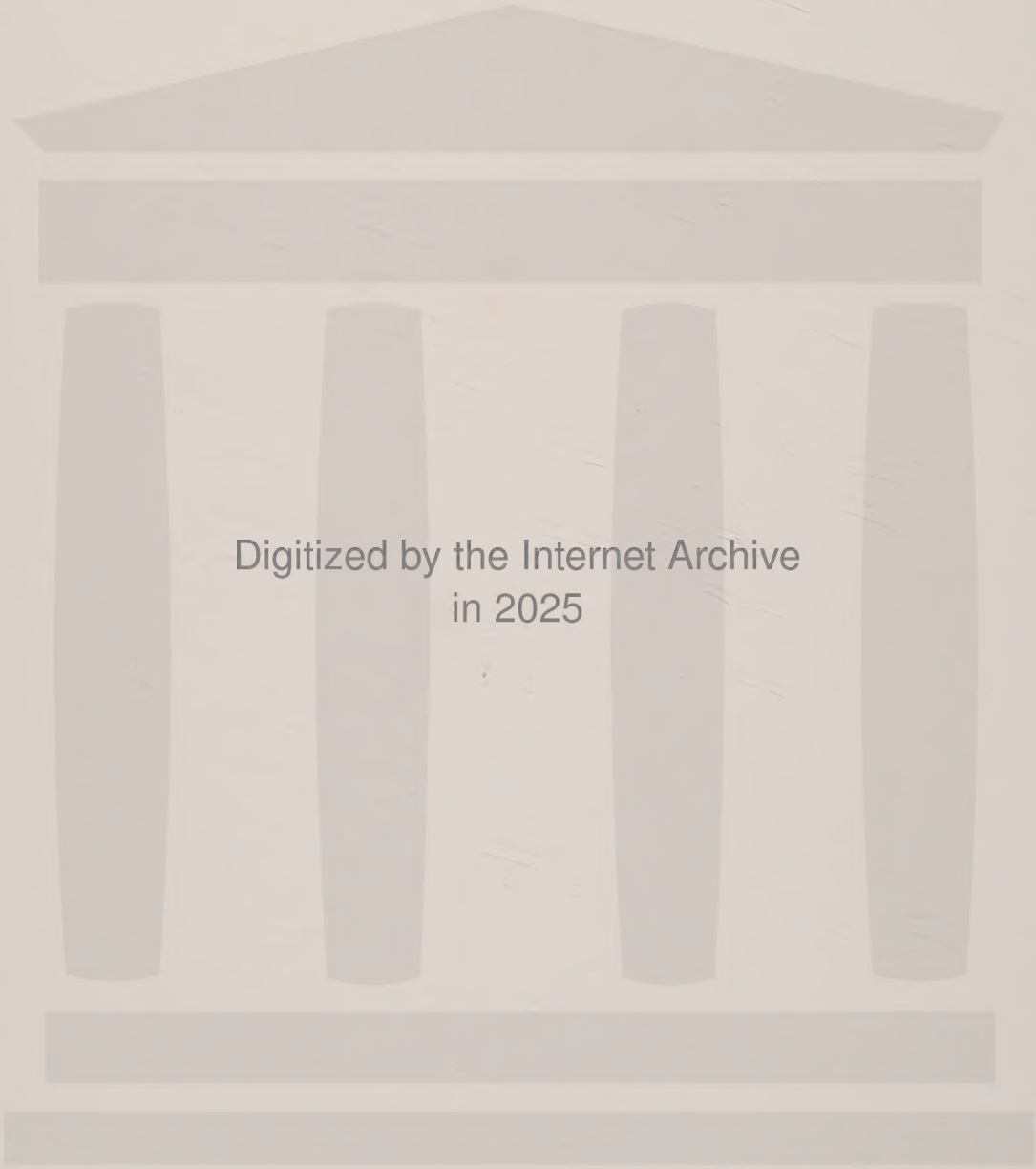
AND

E. H. BARKER

PERTH
WESTERN AUSTRALIA

1981



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PERTH

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THE WESTERN ROCK LOBSTER FISHERY 1976-77

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THE WESTERN ROCK LOBSTER FISHERY 1976-77

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I INTRODUCTION

The fishery for the western rock lobster *Panulirus cygnus* is one of the most important single fisheries in Australia and an important export earner for the State. The fishery is governed by a complex set of regulations which have been reviewed by Bowen (1971) and which are designed to limit the total effort to acceptable levels and to enforce a legal minimum size. It is thus important to constantly monitor the state of the fishery both to ensure that the effort is remaining within the accepted limits and that the regulations are adequately performing their function of maintaining reasonably stable catches. Inherent in this monitoring of the fishery is a careful examination of fishing practice, gear, etc., which may lead to increases in efficiency which may not be detectable through the usual calculated effort figures.

This paper is the sixth of a series of annual reviews of the previous rock lobster season which will discuss fishing practice, catches, effort, mean size and various other factors, a knowledge of which will help towards a better understanding of the status of the fishery.

II METHODS

Catch and effort data were extracted from figures supplied by the Australian Bureau of Statistics and also from research log book data, while mean size information was gathered from measurements made by Departmental Research Staff aboard commercial vessels fishing from Dongara, Jurien, Lancelin and Fremantle. Information on trends in fishing practice was gathered principally from conversation with fishermen at various ports as well as from comments made in research log books.

III RESULTS

A. CATCH AND EFFORT DATA

The fishing season extends from 15 November to 14 August* and may be subdivided into three distinct phases, viz (i) the "whites" fishery (George, 1958) which begins suddenly in late November (as pale-coloured newly-moulted rock lobsters leave the shallow reef areas) and arbitrarily finishes on 31 December; (ii) the "coastal red" fishery which begins on 1 January and ends on 14 August,* and (iii) the Abrolhos Islands fishery which is open from 15 March to 14 August.*

*N.B. Starting with the 1977/78 season the fishing season was closed on 30 June.

Catches and Effort (in number of Pot Lifts) were as follows:

"Whites" catch	=	3 016 301 kg
"Whites" effort	=	2 795 467 pot lifts
"Coastal Reds"	=	4 696 995 kg
"Coastal Reds" effort	=	6 850 774 pot lifts
Abrolhos catch	=	1 599 146 kg
Abrolhos effort	=	1 502 049 pot lifts
Total catch	=	9 312 442 kg
Total effort	=	11 148 290 pot lifts

These figures do not include "cash" sales (i.e. rock lobsters which are sold for cash and are not recorded in the fisherman's monthly returns of catches) or the total amateur catch which is estimated at approximately 200 000 kg. Figure 1 shows comparative catch, effective fishing effort (see below) and catch per effort data from previous years.

Catch and effort data from various statistical blocks (Figure 2) are shown in Table 1 with catches expressed in kg weight and effort as number of pot lifts. Table 2 shows catch per pot data for the same statistical blocks. Using the method of Gulland (1969) to calculate effective fishing intensity, with each month's effort in pot lifts being weighted according to the relative catchability in the month (Morgan, 1974), the total effective fishing intensity was 8 529 948 units of effort, 5.3% greater than the 1975/76 season.

*B. EXPORTS AND GRADE CATEGORIES

Rock lobster tails processed for export are graded by weight and packed in 11.34 kg cartons. The various grades together with the percentage of cases packed in each grade for the period November 1976 to May 1977 were as follows:

Grade	% of cases
A (140 - 170 grams)	22.1
B (170 - 226 grams)	42.6
C (226 - 283 grams)	23.5
D (283 - 340 grams)	5.5
E (over 340 grams)	6.3

Production figures for the period June to August are not available.

* Section B is based on data provided by the Australian Department of Primary Industry.

C. MEAN SIZE

Samples of rock lobsters were measured aboard commercial vessels using standard pots with 54 mm escape gaps in four depth categories from four selected ports. The sample would hence include all commercial size rock lobsters, plus undersize which would have been reduced in number by selection by the escape gap (Bowen, 1963). Mean carapace lengths of males and females in the various depth categories at Fremantle, Lancelin, Dongara and Jurien throughout the fishing season have been compared in Table 3. The many omissions in the table are due to either fishermen not fishing the area in question or to some circumstance (breakdown, etc) which prevented the data from being collected.

D. NUMBER OF BOATS

The number of boats licensed in Zones A, B, C, D and E to fish for rock lobsters is carefully controlled, though boat owners are able to nominate their choice of fishing area, viz. north or south of 30^{o}S.

Number of boats licensed in 1976-77	=	802
Number of boats licensed north of 30^{o}S	=	390
Number of boats licensed south of 30^{o}S	=	412

E. FORECAST OF 1976/77 RECRUITMENT

Settlement of puerulus larvae during 1972/73 was similar to that in 1971/72 (B.F. Phillips pers. comm.) and this resulted in similarly good recruitment to the commercial fishery in 1976/77 and subsequent good catch rates.

F. INTRODUCTION OF NEW LEGISLATION

As from 1 April 1977 the annual fee payable in respect of a boat authorised to operate in the West Coast Rock Lobster Fishery shall be calculated by zone and the number of authorised pots, as follows:

Zone	Fee per rock lobster pot authorized to be carried
Zone A or Zone B or both	3.00
Zone C or Zone D or both	2.50
Zone E	1.50

As from 1 April 1977 the annual fees for the various types of processing establishments were amended.

Information regarding these changes to the legislation governing the rock lobster fishery, as well as the Department of Fisheries and Wildlife's policies on various issues, may be found in Fishing Industry News Service (F.I.N.S.), Vol.10 No.1 (Sept. 1977) pp. 8,9.

G. EFFECTS OF NEW LEGISLATION

The changes in the legislation were of an administrative nature and hence had little direct effect on levels of catch and fishing effort.

H. INNOVATIONS TO BOATS AND GEAR

Figures supplied by the Harbour and Light Department showed that a total of 59 rock lobster boats were replaced during the period 1 July 1976 to 30 June 1977. In the northern area a total of 30 boats were replaced and ranged in size from 6.55 metres to 17.06 metres with an average size of 9.41 metres, whilst in the southern area a total of 29 boats were replaced ranging in size from 6.08 metres to 16.98 metres and averaging 11.38 metres in length. The trend in the northern area was towards small to medium size vessels constructed mainly of fibre glass, whilst in the southern area the trend was towards medium sized vessels also constructed mainly of fibre glass. During this period there was an increase of 321% on the number of boats replaced during the 1975/76 season. The boat replacements were constructed as follows:

	Wood	Fibre Glass	Aluminium
Geraldton	4	21	5
Fremantle	7	20	2
	11	41	7

Data from research log books showed the following usage of various types of pots by fishermen north and south of 30° South:

	Stick and Cane Beehive	Batten	Steel Beehive
North	10%	84%	6%
South	61%	32%	7%

A small number of large steel and wire mesh pots with single side entrances constructed of trawl mesh were also used in several areas. Batten pots with built in bait containers became popular in the northern sector of the fishery.

I. BAIT

Data from research log books showed the following usage of bullock hocks and pieces of cattle hide as a primary bait in both northern and southern areas:

	Hocks	Hides
North	68%	32%
South	47%	53%

During the 1976/77 season a great range of fish baits were available and were used in conjunction with hocks and hides. The most popular of the fish baits used were as follows: Australian herring or ruff *(Arripis georgianus)*, Western Australian salmon heads *(Arripis trutta esperi)*, Eastern salmon *(Arripis trutta marginata)*, pilchards *(Sardinops neopilchardus)*, mullet *(Mugil cephalus)*, snapper heads *(Chrysophrys sp.)*, yellow eyed mullet *(Aldrichetta forsteri)*, tuna heads, scaly mackerel *(Amblygaster postera)* and bony herring *(Fluvialosa vlaminghi)*. Southern Ocean Fish Processors produced a comprehensive range of rock lobster baits from fish trawled in the Great Australian Bight. These baits were used (throughout the season) although were less popular than the above mentioned baits.

Craylure, a prepared rock lobster bait, gained in popularity during the 1976/77 season.

J. DISTRIBUTION OF FISHING

The distribution of fishing is shown in Table 1. The pattern of fishing does not vary greatly from season to season and is dependent on the density of rock lobsters in the various depth categories. Throughout the season the usual pattern of fishing occurred, i.e. concentrated in the shallows during November and December, followed by deep water potting during the latter part of December, January and February, back to the shallows during the latter part of February, March and April and in mixed depths (mainly shallower), depending on weather and density of rock lobsters, throughout the remainder of the season.

K. AVERAGE NUMBER OF DAYS WORKED PER BOAT PER MONTH

Month	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Days worked	11.2	25.6	16.0	17.4	22.0	21.6	17.1	14.9	16.5	6.1

The average number of days worked per boat per month during November and December was 10.1% up on the 1975/76 season and for the period January to August was 0.6% up on the 1975/76 season.

The average number of days worked per boat per month for the 1976/77 season was 17.5, which was an increase of 2.9% on the 1975/76 season.

*L. PRICE OF ROCK LOBSTERS

Price to fishermen, ranged from $4.75 (cash) to $5.25 (pool) per kg. The range of prices paid on the New York wholesale market:

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* Section L is based on data provided by the Australian Department of Primary Industry.

Grade	$Aust. per kg
4 - 6 oz (113-170 grams)	14.55 - 15.06
6 - 8 oz (170-226 grams)	13.96 - 14.95
8 - 10 oz (226-283 grams)	13.86 - 14.91
10 - 12 oz (283-340 grams)	13.96 - 14.95
12 - 16 oz (340-453 grams)	13.27 - 14.16
16 - 20 oz (453-566 grams)	12.87 - 13.73
over 20 oz (over 566 grams)	12.58 - 13.53

M. MARKET TRENDS AND ECONOMIC FACTORS

The USA market had comfortably absorbed the 1975/76 season production and was ready for the arrival of the 1976/77 season shipments. Premium prices were obtainable for airfreighted parcels but prices quickly settled back to the highs reached during 1976 after the first significant shipments were received.

At these price levels the demand remained constant and there was very little price fluctuation during the marketing year.

November's devaluation of the Australian dollar by about 17.5% lifted prices domestically however the devaluation when averaged over the year was about 12.0%, compared with 1976.

N. AVERAGE VALUE PER POT ON POT REDISTRIBUTION

From about $290 to $500.

O. SEA WATER TEMPERATURES AND SALINITIES

These have relevance to the behaviour and catch rates of rock lobsters (Morgan, 1974). The average sea water temperature during the rock lobster season (i.e. 15 November to 14 August) at Waterman (aquarium intake temperature) was 20.1^{o}C, with a maximum of 23.1^{o}C on 6 February 1977 and a minimum of 16.7^{o}C on 26 June 1977. The average salinity during the season at Waterman (aquarium) was 35.48‰ with a maximum of 36.18‰ on 7 and 14 March 1977 and a minimum of 34.70‰ on 8 August 1977.

Bottom temperatures and surface salinities in waters of various depths in the Fremantle, Lancelin, Jurien and Dongara areas were collected as part of the monitoring of rock lobster catches (Item B) and are shown in Table 4. Other records are maintained by CSIRO.

While most of the breeding females are found in the 20 - 30 fathom range, no variation has been observed in the size at first breeding from one depth category to another, except at Jurien over 30 fathoms (Chittleborough, pers. comm.). Hence the data for December, January and February from all depths with the exception of Jurien over 30 fathoms may be pooled to indicate the size frequency of breeding (i.e. "berried" and mated) females and this has been done in Figure 3. The mean size of breeding females was greater at Fremantle and Lancelin than at either Jurien or Dongara with the mean sizes being 89.5 mm for Jurien, 94.5 mm for Dongara, 104.3 mm for Fremantle and 103.5 mm for Lancelin. By comparison the mean sizes at first breeding (i.e. the smallest carapace length at which 50% have been mated) were found to be 103 mm at Fremantle, 95 mm at Lancelin, 98 mm at Jurien and 95 mm at Dongara.

IV DISCUSSION

The 1976/77 catch increased to 9 312 442 kg which was an increase of 6.8% on the 1975/76 season. That this increase in catch was a reflection of the greater amount of effective fishing effort (up by 5.3% on 1975/76) rather than greater stock densities is supported by the facts that (a) overall catch rates were similar (0.84 kg/pot lift in 1976/77 compared with 0.85 kg/pot lift in 1975/76) and (b) similar recruitment levels in the two years were expected to result from puerulus settlement four years previously.

The price fishermen received for their catch increased significantly on the previous season. This was only slightly offset by a marginal increase in the price of fuel whilst the wholesale price of the more popular lines of bait remained relatively stable.

As a result of the Federal Government's Income Tax Investment Allowance Scheme together with buoyant economic conditions within the rock lobster industry the number of new boat replacements increased considerably on the previous season.

V ACKNOWLEDGEMENTS

Measurements aboard fishing vessels were performed by Mr R. Bell and Mr G. Lymn. The information on Market Trends and Economic Factors was provided by Mr R.D. Harrison of Craig Mostyn & Co. Pty. Ltd.

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TABLE 1: CATCH (IN KG WEIGHT) AND EFFORT (IN POT LIFTS) FOR THE 1976/77 ROCK LOBSTER SEASON IN VARIOUS STATISTICAL BLOCKS

BLOCK	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	TOTAL
2612	-	-	-	-	-	-	-	-	-	-	-
2613	-	-	-	-	-	-	-	-	-	-	-
2712	-	-	3532 (2000)	3190 (3600)	-	-	-	-	-	-	6722 (5600)
2713	10567 (11334)	50749 (42167)	28550 (43485)	26210 (34960)	33890 (39911)	30916 (38799)	20204 (30712)	21033 (32676)	17583 (35476)	4862 (10943)	244564 (320463)
2714	3480 (5332)	26124 (24629)	7075 (15151)	6138 (12365)	14830 (16196)	11412 (10967)	9753 (9792)	6971 (9469)	4247 (5981)	1268 (1066)	91298 (110948)
2812	-	-	-	-	-	-	-	-	-	-	-
2813	780 (1694)	12819 (11117)	760 (3227)	2472 (4039)	566689 (286547)	591622 (487888)	248791 (341532)	57998 (130138)	102454 (195783)	31592 (60161)	1615977 (1522226)
2814	76018 (122222)	267344 (241715)	40949 (91274)	42881 (102095)	61756 (88873)	62289 (82612)	46218 (72680)	43289 (70786)	47512 (76136)	14321 (25153)	702577 (973546)
2912	-	-	-	-	-	-	-	-	-	-	-
2913	-	10169 (6114)	1326 (4290)	4951 (10485)	10276 (6560)	8175 (6885)	1762 (1420)	1406 (1128)	1244 (2548)	483 (1374)	39792 (40804)
2914	181788 (272740)	682016 (580773)	205330 (260477)	141524 (252338)	274597 (230772)	161984 (203789)	104389 (146261)	59702 (111803)	104026 (147499)	34377 (45091)	1949733 (2251543)
3012	-	-	-	-	-	-	-	-	-	-	-
3013	-	-	-	-	-	-	-	-	-	-	-
3014	80132 (120216)	551890 (387414)	264544 (223076)	113827 (195613)	189732 (252576)	181831 (232637)	81744 (125527)	46390 (100848)	46064 (97869)	6045 (17387)	1562199 (1753163)
3015	13322 (24889)	86631 (62873)	54490 (51281)	45493 (54680)	48085 (71036)	50032 (139082)	10322 (25671)	7221 (13811)	9242 (19259)	1412 (2826)	326250 (465408)
3112	-	-	-	-	-	-	-	-	-	-	-
3113	-	-	-	-	-	-	-	-	-	-	-
3114	9642 (11685)	83946 55701)	41375 (38129)	17646 (21846)	46059 (46766)	14645 (23532)	3175 (5623)	1357 (3075)	1436 (1739)	561 (360)	219842 (208456)
3115	75327 (171739)	544230 (434747)	278658 (315259)	253021 (327748)	255990 (499126)	206936 (300406)	73950 (191368)	57679 (154761)	60249 (147415)	12538 (32412)	1818578 (2574981)
3212	-	-	-	-	-	-	-	-	-	-	-
3213	-	-	-	-	-	-	-	-	-	-	-
3214	-	10845 (6414)	9563 (7618)	26701 (9841)	5028 (6086)	718 (1580)	250 (305)	953 (2062)	-	-	54058 (33906)
3215	13362 (39657)	221539 (153169)	83676 (101885)	78005 (116045)	89741 (137484)	40607 (86989)	38076 (72280)	28078 (52435)	32326 (56584)	4621 (9627)	630031 (826155)
3314	-	-	509 (640)	1497 (2100)	2679 (1750)	4037 (3935)	519 (1230)	400 (960)	2915 (2689)	688 (490)	13244 (13794)
3315	184 (1330)	3397 (5796)	6288 (6580)	1512 (2760)	3185 (4260)	4066 (5281)	5957 (6263)	5625 (7600)	3082 (4968)	4281 (2459)	37577 (47297)
3414	-	-	-	-	-	-	-	-	-	-	-
TOTAL	464602 (782838)	2551699 (2012629)	1026625 (1164472)	765068 (1150515)	1602537 (1687943)	1369270 (1624382)	645110 (1030664)	338102 (691552)	432380 (793946)	117049 (209349)	9312442 (11148290)

TOTAL CATCH = 9312442 KG
TOTAL EFFORT = 11148290 POT LIFTS

Effort Figures are shown in parenthesis and Catch Figures are underlined.

TABLE 2: CATCH/EFFORT DATA FOR 1976/77 SEASON IN VARIOUS STATISTICAL BLOCKS.

Block	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Total
2612	-	-	-	-	-	-	-	-	-	-	-
2613	-	-	-	-	-	-	-	-	-	-	-
2712	-	-	1.77	0.89	-	-	-	-	-	-	1.20
2713	0.93	1.20	0.66	0.75	0.85	0.80	0.66	0.64	0.50	0.44	0.76
2714	0.65	1.06	0.47	0.50	0.92	1.04	1.00	0.74	0.71	1.19	0.82
2812	-	-	-	-	-	-	-	-	-	-	-
2813	0.46	1.15	0.23	0.61	1.98	1.21	0.73	0.45	0.52	0.53	1.06
2814	0.62	1.11	0.45	0.42	0.69	0.75	0.64	0.61	0.62	0.57	0.72
2912	-	-	-	-	-	-	-	-	-	-	-
2913	-	1.66	0.31	0.47	1.57	1.19	1.24	1.25	0.49	0.35	0.98
2914	0.67	1.17	0.79	0.56	1.19	0.79	0.71	0.53	0.71	0.76	0.87
3012	-	-	-	-	-	-	-	-	-	-	-
3013	-	-	-	-	-	-	-	-	-	-	-
3014	0.67	1.42	1.19	0.58	0.75	0.78	0.65	0.46	0.47	0.35	0.89
3015	0.54	1.38	1.06	0.83	0.68	0.36	0.40	0.52	0.48	0.50	0.70
3112	-	-	-	-	-	-	-	-	-	-	-
3113	-	-	-	-	-	-	-	-	-	-	-
3114	0.83	1.51	1.09	0.81	0.98	0.62	0.56	0.44	0.83	1.56	1.05
3115	0.44	1.25	0.88	0.77	0.51	0.69	0.39	0.37	0.41	0.39	0.71
3212	-	-	-	-	-	-	-	-	-	-	-
3213	-	-	-	-	-	-	-	-	-	-	-
3214	-	1.69	1.26	2.71	0.83	0.45	0.82	0.46	-	-	1.59
3215	0.34	1.45	0.82	0.67	0.65	0.47	0.53	0.54	0.57	0.48	0.76
3314	-	-	0.80	0.71	1.53	1.03	0.42	0.42	1.08	1.40	0.96
3315	0.14	0.59	0.96	0.55	0.75	0.77	0.95	0.74	0.62	1.74	0.79
3414	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0.59	1.27	0.88	0.66	0.95	0.84	0.63	0.49	0.54	0.56	0.84

TOTAL CATCH = 9,312,422 KG.

TOTAL EFFORT = 11,148,290 POT LIFTS

TABLE 3: MEAN CARAPACE LENGTHS (MM) OF MALE AND FEMALE ROCK LOBSTERS IN VARIOUS DEPTH CATEGORIES AT FREMANTLE, LANCELIN, JURIEN AND DONGARA THROUGHOUT THE FISHING SEASON.

YEAR	AREA	MONTH	0-10 Fms		10-20 Fms		20-30 Fms		30+ Fms	
			MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
1976/77	FREMANTLE	NOV			80	77				
		DEC	76	76					97	91
		JAN	71	70					98	91
		FEB	73	71			100	100		
		MAR	76	72	86	83				
		APR	75	72			104	95		
		MAY	76	73	89	81				
		JUN	74	73			94	89		
		JUL								
		AUG	71	70						
1976/77	LANCELIN	NOV	74	72	76	78				
		DEC	75	73	79	76				
		JAN	71	74	85	85	85	84		
		FEB	74	73	84	91	108	110		
		MAR	72	71	78	75				
		APR	73	72			90	86		
		MAY	75	74						
		JUN	73	71						
		JUL	75	74						
		AUG								
1976/77	JURIEN	NOV	74	73						
		DEC	77	75	80	76	87	87		
		JAN	73	72	78	74				
		FEB	73	71						
		MAR	72	70					85	83
		APR	72	70			88	83		
		MAY	74	72						
		JUN	78	78						
		JUL	72	71						
		AUG	75	75						
1976/77	DONGARA	NOV	76	73						
		DEC	77	74	76	73				
		JAN	74	72			92	90	93	88
		FEB	70	71	75	75				
		MAR	77	75			78	75	82	80
		APR	73	72			86	85		
		MAY	79	76			107	98		
		JUN	74	73			85	86		
		JUL	71	69			93	89		
		AUG	68	66			92	88		

TABLE 4: BOTTOM TEMPERATURE (^{O}C) AND SURFACE SALINITY IN PARTS PER THOUSAND FOR FREMANTLE, LANCELIN, JURIEN AND DONGARA OF WATERS BETWEEN VARIOUS DEPTH CONTOURS FOR THE 1976/77 SEASON.

Area	Depth Fath	NOV		DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG	
		Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal
FREMANTLE	0-10			19.7	35.55	21.5	36.15	23.6	36.29	22.0	36.64	19.2	36.62	18.6	35.83	18.6	35.48	18.0	35.50	19.2	35.30
	10-20	19.7	35.52							20.7	35.95			18.7	35.68						
	20-30							21.0	35.77			20.4	35.88			18.8	35.44				
	30+			20.0	35.63	20.2	35.46														
LANCELIN	0-10	19.5	35.50	21.0	35.64	21.2	35.73	23.4	36.09	20.6	35.93	19.8	35.91	18.5	-	20.0	35.35	18.7	-		
	10-20			22.0	35.61	21.4	35.73	21.8	35.86	20.3	36.16										
	20-30					20.9	35.74	21.2	-			20.2	35.63								
	30+																				
JURIEN	0-10	19.6	35.55	20.5	35.67	21.4	36.10	21.7	36.32	21.5	36.21	21.4	35.79	19.5	35.71	18.1	35.55	18.9	35.40	18.3	35.52
	10-20					21.0	35.72														
	20-30			20.2	36.20							21.2	36.19								
	30+									21.7	35.75										
DONGARA	0-10	19.1	35.64	21.5	35.79	20.6	35.72	21.8	36.81	21.8	35.85	21.0	36.25	20.2	36.02	18.3	35.35	18.8	35.34	17.9	-
	10-20			20.8	35.32			22.4	36.22												
	20-30					21.6	35.63			21.9	35.75	21.0	35.91	21.9	35.93	18.3	-	20.2	35.32	18.5	35.43
	30+					20.8	35.59			22.1	35.73										

Temperatures were taken using a protected reversing thermometer and surface water samples were taken and later analysed to determine salinity. For the most part figures shown represent single readings at the time of monitoring each month.

TABLE 5: 1976/77 SEX RATIO BY MONTH AND DEPTH CATEGORY, FIGURES ARE % OF FEMALES IN THE TOTAL.

AREA	DEPTH RANGE FATH.	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
DONGARA	0-10	50	53	57	53	54	54	54	53	55	57
	10-20		57		50						
	20-30			81		47	64	61	60	72	59
	30+			78		58					
JURIEN	0-10	42	54	54	46	53	54	60	61	57	56
	10-20		56	55							
	20-30		51				61				
	30+					71					
LANCELIN	0-10	55	53	57	56	53	57	53	51	50	
	10-20	90	57	53	49	57					
	20-30			55	79		56				
	30+										
FREMANTLE	0-10		55	51	55	53	59	54	61	47	50
	10-20	57				46		51			
	20-30				67		65		56		
	30+		53	60							

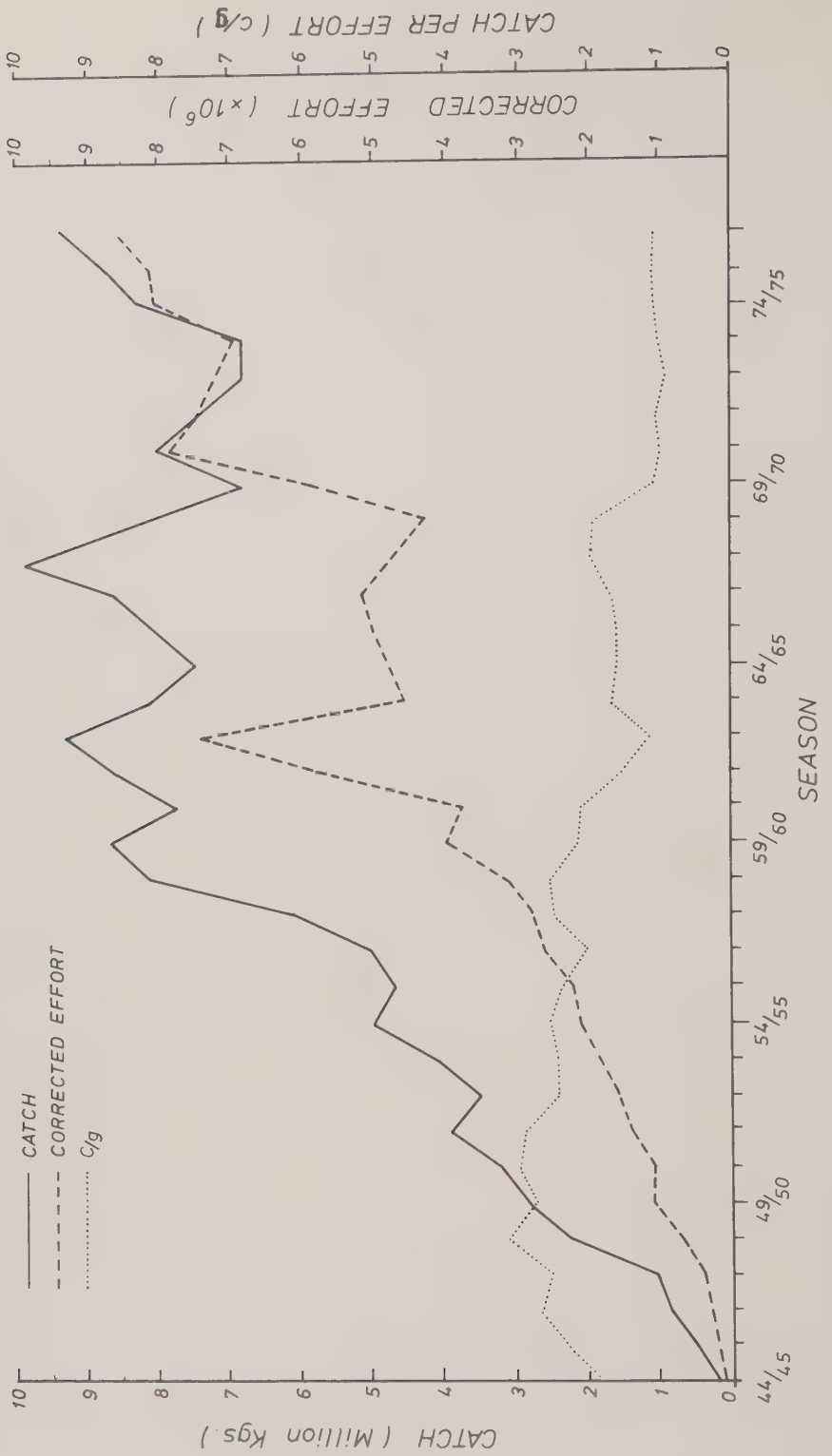

Figure 1. Rock Lobster Catch, Effective Fishing Effort and Catch per Unit of Effort Data.

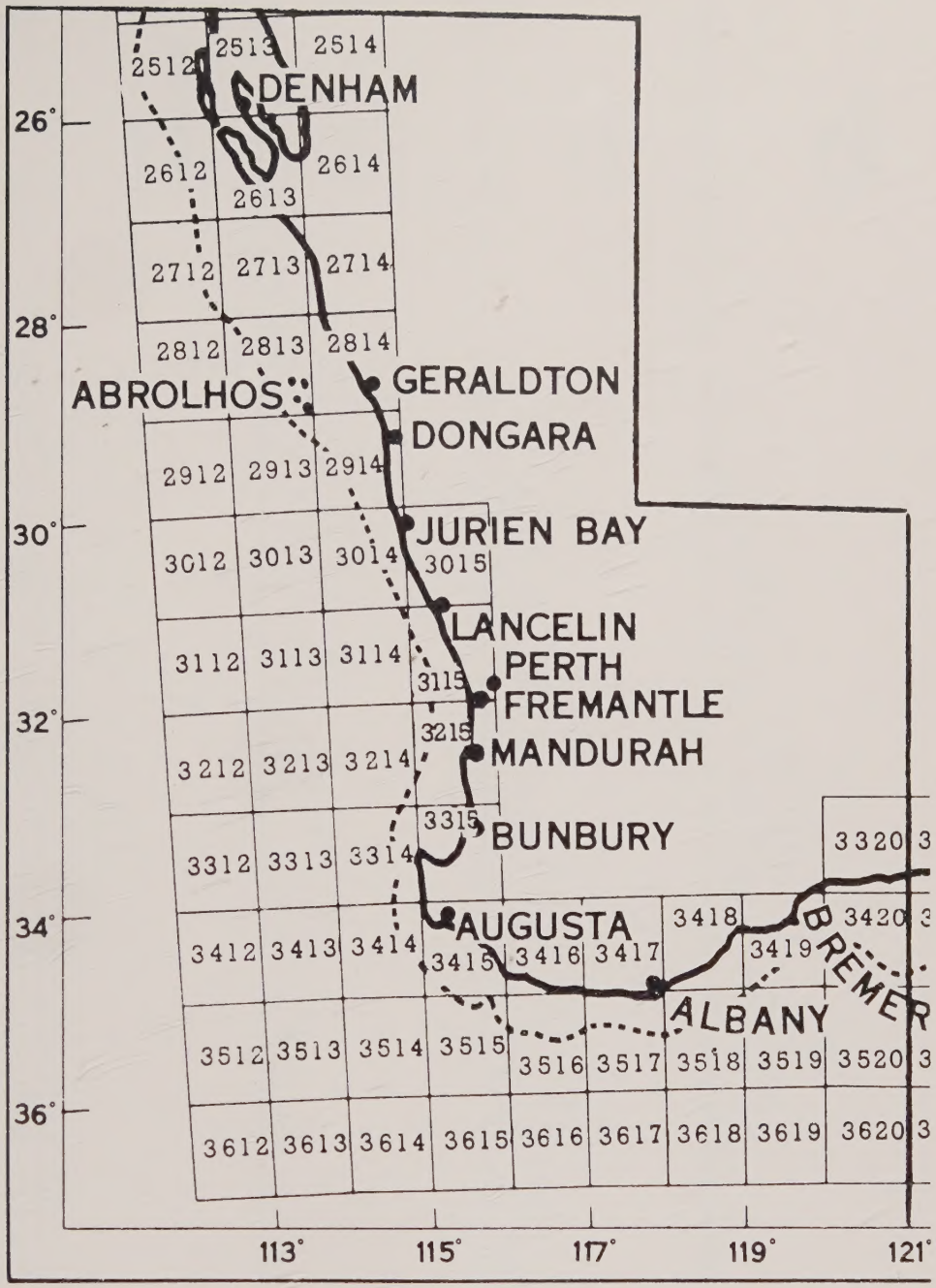

FIGURE 2. Rock Lobster Fishing Areas

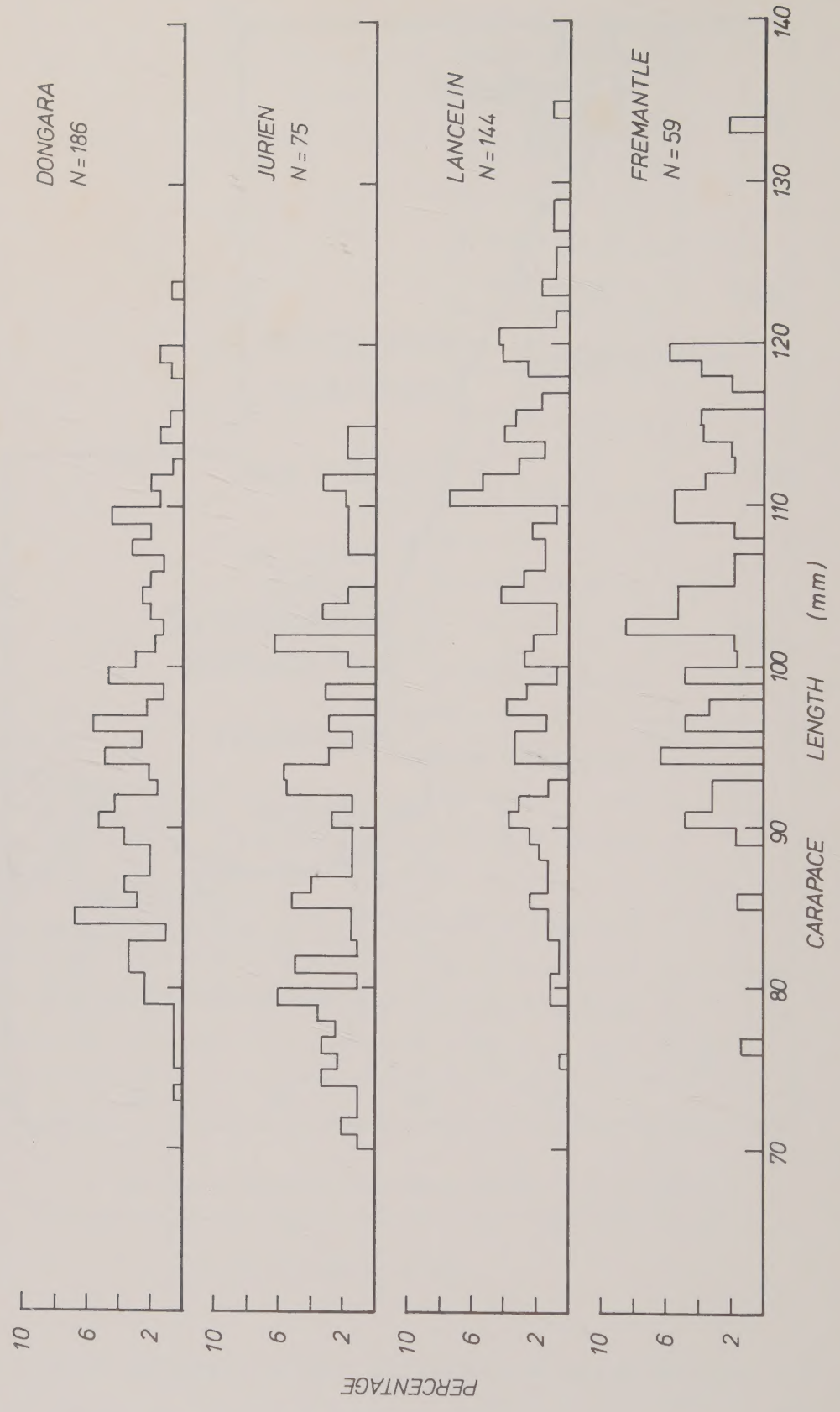

Figure 3. Length Frequency of Breeding Female Rock Lobsters Taken from December 1976 to February 1977.

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